

SUBJECT DISPERSION STUDIES IN INTERNATIONAL ECONOMICS

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In order to determine the nature of the literature of the International Economics, citations appended to the articles published in the Journal of International Economics covering the period 1971-1985 have been analysed. Interrelationship among different branches of the subject has been determined. Results show that 75% of citations belonged to the subject groups of international trade, production economics, monetary economics, financial economics, and international finance.

INTRODUCTION

Dispersion means to break up and scatter in all directions; to spread about; to distribute from a source or centre. So subject dispersion is the breaking up of the literature related to a particular subject. Citation analysis can be used for understanding the nature of literature of a particular discipline. If we analyse the citations appended to research papers and try to group them according to their subject content we can understand the nature of the host subject. The amount of scatter shown by the citations is presumably related to the 'breadth' of the subject material covered by authors in the course of their researches [6]. Subject dispersion studies would help (i) to determine the breadth, structure and development of the subject, (ii) to study the interrelationship of different branches of a subject and, (iii) to assess the importance of one branch over the other for the overall development of the subject.

Most of the earlier works on subject analysis through citations are based on the percentage of the frequency of appearances of citations belonging to the subfields of a discipline. One such instance is the work of Narin, Pinaski and Gee [8] who have studied the structure of biomedical literature through citations. Based on the number of journals (by title and subjects) needed to cover 90% of all the references concerned

in a field, Brown [1] has studied the relative scatter of journals in physics, chemistry, mathematics, geology, botany and zoology. By analysing the requests during a survey conducted at the National Lending Library, U.K., the subject approach of the social scientists have been studied by Wood and Bower [9]. Subsequently their results were compared by Earle and Vickery [3] with the results they obtained through citation analysis of the social science literature used in the U.K. The important studies conducted in the field of economics are by Mahapatra and Musib [5], Fletcher [4] and Musib and Mahapatra [7]. An attempt has been made in this paper to find out the extent of subject dispersion among the citations and the nature of subjects that influence the formation and development of international economics. It also highlights the mutual relationship among its branches based on the co-occurrences in citations.

METHODOLOGY

The subject analysis of citations appended to the articles ($n = 392$) published in the *Journal of International Economics* covering the period 1971 (Vol 1) to 1985 (Vol 19), were made with the help of subject heading lists. As far as practicable the specific subjects of the documents cited were determined. If a citation dealt with two or more subjects the citation was grouped under more than one specific subject assuming that the citation would satisfy the need of research workers from more than one subject. After the analysis, the subjects were ranked according to their frequency of appearance to study the composition of the literature of international economics and the contribution of its subfields towards overall development and the most frequently appeared subfields were subjected to χ^2 test to assess their mutual relationships. Mutual association (χ^2 value) of any two of the subjects at a time was calculated according to formula:

$$x_c^2 \text{ (with Yate's correction) } = \frac{(\text{ad-bc}/\frac{n}{2})^2 \times n}{(a+b)(c+d)(a+c)(b+d)}$$

Where, a = observed number of articles having both the subjects in their citations,
 b = observed number of articles having only one of the subjects in their citations,
 c = observed number of articles having only the other subjects in their citations,
 d = observed number of articles having none of the two subjects in their citations, and
 n = number of articles in the sample (i.e. n = 392).

The x^2 value thus calculated for each pair of subjects was compared against the standard table of significance [2] and if the value fell within 5% (i.e. $p \leq 0.05$) of significance, otherwise it was considered simply due to accident (i.e. independent in nature) and was rejected.

OBSERVATION AND DISCUSSIONS

Contribution of subfields

After analysing the citations into their specific subject groups these were ranked according to their frequency of appearance (Table 1). The total number of subject citations analysed were 7095. But the total number of subject citations exceeded the number of actual citations slightly since a citation which dealt with more than one subject was grouped under the respective subjects. The subject groups of 178 citations could not be determined and therefore excluded from the study. It is seen from Table 1 that the most important subject group is international trade (36.95%), followed by production economics (12.05%) and monetary economics (11.57%). Altogether these three subject groups covered

60% of total literature in international economics. To cover 90% of total literature another six subject groups are required. These are financial economics, international finance, economic growth and development, economics (general) macroeconomics, labour economics. The remaining 25 subject groups contributed only 10% of total literature. Two subjects, mathematics and statistics, also contributed a significant amount of literature.

Association among prominent subfields

To determine the possible association among the prominent subfields and to assess the mutual relationship of one cited subject with another in international economics, x^2 test has been applied. Altogether nine ranked subfields have been considered for the study. This gave 35 combinations of which 21 (58.33%) was statistically significant and other 15 (41.66%) were independent in nature (Table 2). Among the 21 statistically significant associations 18 were significant at .5%, 2 at 5% level and one at 1% level.

CONCLUSIONS

As mentioned earlier the amount of dispersion or scatter shown by the citations appended to papers is presumably related to the breadth of the subject. The amount of subject scatter would help to assess the interests of the research workers within a discipline and to find out the extent to which the subject is dependent on other subjects for its development. In the field of international economics only 9 subject groups are sufficient to cover 90% of total literature in the field, and only 13% subject groups are sufficient to cover 95% of total literature (Table 1).

Study of the mutual relationship among the branches of a discipline reflected in the co-occurrences of the citations is helpful for assessing dependence of one branch over the other, and for subject mapping. As the bond of association among its branches grows stronger, the more unitary becomes its structures.

Table 1 - Rank list of cited subjects

Subjects	No.	%	Cumulative
1. International trade	2622	36.95	
2. Production economics	855	12.05	49.01
3. Monetary economics	821	11.57	60.58
4. Financial economics	609	8.58	69.16
5. International Finance	445	6.27	75.44
6. Econ. gr & devt.	322	4.53	79.97
7. Economics (general)	278	3.91	83.89
8. Macroeconomics	236	3.32	87.22
9. Labour economics	223	3.14	90.36
10. Welfare economics	113	1.59	91.95
11. Mathematics	87	1.22	93.18
12. Statistics	78	1.09	94.28
13. Public finance	69	0.97	95.25
14. International economics	65	0.91	96.17
15. Econometrics	53	0.74	96.92
16. Technology (general)	43	0.60	97.52
17. Land economics	29	0.40	97.93
18. Economic theory	24	0.33	98.27
19. Commerce	20	0.28	98.55
20. Management	18	0.25	98.80
21. Political Science	13	0.18	98.99
22. Microeconomics	13	0.18	99.17
23. Law	10	0.14	99.31
24. Social welfare	9	0.12	99.44
25. Geography	8	0.11	99.55
26. Science	5	0.07	99.62
27. General	5	0.07	99.69
28. Education	4	0.05	99.75
29. Sociology	4	0.05	99.81
30. Agriculture	4	0.05	99.86
31. Public Administration	4	0.05	99.92
32. History	3	0.04	99.96
33. Medical Science	3	0.04	100.00

Table 2 - Association among subfields

	Inter- national trade	Produc- tion eco- nomics	Monetary economics	Financial economics	Economic growth & Dev.	Welfare economics	Macro- economics	Labour economics	Inter- national finance
International trade		28.66*	20.59*	17.44*	4.98**	1.53	1.47	...02	46.01*
Production economics			21.38*	0.25	7.91*	1.89	0.90	6.98***	9.33*
Monetary economics				39.38*	3.85**	20.84*	31.95*	0.18	42.45*
Financial economics					0.24	11.74*	29.91*	14.79*	11.43*
Economic growth & development						0.10	0.31	15.42*	9.49*
Welfare economics							0.91	0.06	0.35
Macro economics								16.01*	0.02
Labour economics									1.24
International finance									

*Significant at .5% level. **Significant at 5% level. ***Significant at 1% level.

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